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River Resources Allocation and Participatory Irrigation Management in Japan Today

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In Japan, the main source of irrigation is not ground water but river water, which is allocated among water users such as irrigation associations, mayor to supply domestic water, and CEOs of manufacturing companies to use water by water right systems or by the permission of the Minister. The amount of river water administratively available to water users is "Normal" low flow discharge with a risk of 10% probability exceeding "River Maintenance" flow.

The Irrigation Associations or (farmers') Water Users Associations, called "Land Improvement Districts" in Japan, are managed to satisfy the requirements of PIM, 1) to establish democratic farmers' irrigation associations, 2) to collect water charge from farmers. In principle, the construction costs of the projects are subsidized, but the operation and maintenance costs are not subsidized.

Key words: water resource allocation, water right, LID, PIM, water charge

1. Introduction

Rice-paddy irrigation for small farms in the monsoon area of the tropical regions is the main target of this seminar. As a control for comparative discussions, some categories or classifications are considered; such as humid (H) vs semi-arid (A), tropical (Tr) vs temperate (Tm), small farm (S) vs large farm (L), diversion (D) vs tank-fed (T), and natural river flow (N) vs reservoir-fed (R).

Each country participating in the TASAE seminar belongs to the categories outlined below;

Afghanistan (Af)	A,Tm,S,D, N
India (I)	H,Tr, S,T,R
Thailand (T)	H,Tr, S,D,N
Cambodia (C)	H,Tr, S,D, N
Philippine (P)	H,Tr, S, D,R
Korea (K)	H,Tm,S,D,R
Japan (J)	H,Tm,S,D,R
Australia (Au)	A.Tm,L,D,R

Japan's experience will be introduced as one of the basis for comparative discussions on river water resources allocation and participatory irrigation management.

2. Characteristics of Available Water Resources

Two kinds of water resources include;

1) Ground water: private property (a landowner's property)

Characterized as stable but less available in quantity.

2) River water: public property (national property)

Characterized as fluctuating but more available in quantity.

Therefore the major source of irrigation water is not ground water but river water in Japan.

3. Water Rights System in Japan

River water resources allocation is managed, and river flow conditions (both floods and low flow) controlled and regulated by the Ministry of Land and Transportation of the National Government. Government Permission is indispensable for water

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users' diversion of river water. Buying, selling, borrowing and lending between users are forbidden, because river flow water is "national" or "public" water that cannot be owned by any juridical person as personal property.

River water resources allocation among water users in sectors such as farmer organizations for irrigation, cities or municipalities for urban or domestic water supplies, manufacturing factories for industrial water and hydroelectric power generation, have been administered by the National Government through the legal systems, "Water Rights" since 1896 in Japan. Most existing diversions are for irrigation of rice-paddies and regarded as already "permitted" water rights. Principles of river water resources allocation are "Appropriative Right" or "First in time-First in Right".

Potential water users must apply to the National Government.

A complete application includes:

−The name and address of the applicants
−The nature and the proposed place of use
−The proposed place of diversion
−The location and description of the proposed head works and other works
−The amount of use for irrigation of rice-paddies, the amount of the use changes applied against stages such as nursery bed〜/puddling and transplanting〜/growing〜 etc. and this applies only in the irrigation (summer) season, not in off-season.
−Other information

Application and permit fees are not charged. The Government gives permission to an applicant, when there are no protests based on alleged injury to prior rights

4. "Standard" "Normal" Low Flow

"Standard Low Flow" or "Normal Low Flow" technically defined by the Government is a basis or criteria of regulation and control of low flow in river channels in a drought.

The definition of standard low flow or normal flow is: low flow discharge with 90% exceeding probability in a river channel, or 10% risk probability＝90% safety probability (occurrence: once-in-ten-years on the average).

"Standard low flow" discharge minus "Maintenance flow" discharge is available to diversion of river flow by an applicant. "Standard low flow" should be more than or equal to Maintenance flow discharge and all prior right discharges.

"Maintenance flow" is instream flow discharge for environmental conservation and other uses such as navigation, dilution of polluted water, etc.

River flows are controlled and regulated by the administration of the Government. If available waters are not enough for a new applicant, a reservoir should be constructed to release water as a supplement to the extreme low flow in the river channels during a drought at the applicant's expense based on an order by the Ministry.

In a drought, the ministry officials administer the release of water stored in a reservoir or reservoirs to augment low flow in the river channels and natural river low flow discharge in order to maintain flow conditions that satisfy maintenance flow and prior rights. When emergent drought occurs and river flow discharge becomes lower than the standard low flow, river water resources can be temporarily reallocated by a conference of all water right holders, sometimes not in proportion to the quantity of water rights.

5. Participatory Irrigation Management (PIM)

Principles and philosophies built into the concepts of PIM proposed by the staff of the World Bank are as follows:

1) Farmers (stake holders)(water users) should participate in operation, maintenance and management (OMM) of irrigation systems to establish "democratic" organizations (associations) of "water users" (WUA) of farmers, by the farmers, for the farmers.

2) Market mechanisms;

Beneficiaries should pay a principle (BPP), in other words there is no public subsidy for OMM costs. However, public subsidies as construction costs are permissible as an exception internationally.

6. Land Improvement District (LID)

Japanese farmers irrigation association＝Japanese water user-farmers association LIDs were, are and will be established based on the Land Improvement Act enforced in 1949. LIDs have replaced "(Land owners') Irrigation and Drainage Association" and "(Agricultural) Land Consolidation Association" that existed before World War II, and

Table 1. Construction Cost Sharing

	Sharing Ratio (%)			
Project Type	National G.	Local G.	Municipality (city/town)	LID
National Government Project	67	17	8	8
Local Government Project	50	25	12.5	12.5

have developed a reputation as the most successful organizations of PIM by their performance. The organizational structure and functions of LIDs are briefly presented below as a typical model of a LID for your understanding.

Suppose a typical LID has 6,000 member-farmers and 5,000 ha of beneficial rice-paddy fields. The procedures for management include:

1) 6,000 farmers elect 300 "representatives" from among themselves by secret voting,

one person is allowed only one vote for equity (no discrimination: rich/poor, gender etc.; democracy).

2) 300 representatives elect 10 directors and 3 auditors from among themselves to form the Board of Directors.

3) The Board of Directors can invite some experts as non-member directors.

4) A Director General is elected by elected directors.

5) The Board employs some staff members in its office that are in charge of operation, maintenance and management (OMM).

6) Each activity is discussed and decided by the assembly of representatives.

7) The Board of Directors conducts administration of OMM on the basis of policies approved by the representatives.

The major functions of the LIDs are:

1) Application for a construction project to the Minister of Agriculture, Forestry and Fishery MAFF).

The so-called "construction project" in Japan embraces many different projects including construction, reconstruction, replacement, upgrading and rehabilitation.

2) Repayment of construction costs are 80〜90 percentage subsidized

(remaining 10〜20% levied on member farmers) (Table 1).

3) OMM of constructed irrigation facilities such as a diversion dam, irrigation canals, pump(s), etc. are handed over/transferred from the Government to a LID without "official" public subsidy.

cf. Before and since founding of WUAs before World War II, OMM has been done by landowner and tenant farmers with their own labor and pay, paying land taxes or tenant fees.

rf. Costs of major repairs originating from severe natural disasters such as an earthquake and floods are fully subsidized by the National Government.

4) Membership fees are charged to member farmers in proportion to the area owned by them.

7. Income of a LID Comes from 3 Main Sources:

1) Membership fees (typically ¥50,000 or US $450/year/ha-rice paddy which is approximately 3〜5 % of the yield).

rf. typical paddy yield: 7〜8 tons/ha/year (one crop)

2) Charges, rent, etc. from persons for using the LID operated facilities such as canals for sewage and runoff drainage.

3) "Roundabout" of public subsidy for OMM costs to a LID

8. Typical Diversion Requirements for a Rice-paddy:

For predominant river flow diversion systems diversion is 20〜30 mm/day. For few tank-fed systems diversion is 10 mm/day.

9. Irrigation Rate

The irrigation ratio for a rice-paddy in Japan is almost 100%. In contrast, the irrigation rate for non-paddy crops such as other cereals, vegetables, fruits, flowers and meadows was zero before World War II and is still only 20% of the total fields today.